

CLAIMS

1. A stapler including a horizontal base, an operation handle, a staple striking blade plate, and a staple mount magazine to which a connected staple assembly which is composed of a number of connected staples or a connected staple assembly cassette is mounted, said horizontal base, said operation handle and said staple mount magazine being coupled by means of a pivot shaft member,

wherein said pivot shaft member includes an operation shaft member and a mount shaft member, in which the operation shaft member connects the horizontal base and the operation handle elastically to be rotatable, and the mount shaft portion connects the horizontal base and the staple mount magazine,

said staple mount magazine has a magazine upper dead center so as to be rotatable in a range below the magazine upper dead center through the mount shaft portion,

said staple mount magazine is provided with a staple striking blade plate vertical slit having slit upper and lower dead centers, and

said staple striking blade plate has an upper portion connected to the operation handle and is disposed between the operation handle and the horizontal base, the staple striking blade plate being vertically movable in the staple striking blade plate vertical slit in association with an operation of the operation handle, and when the operation

handle is elastically pushed downward, the lower end of the staple striking blade plate lowers in the staple striking blade plate vertical slit of the staple mount magazine, and the staple striking blade plate has a vertical dimension reaching the horizontal base surface.

2. The stapler according to claim 1, wherein said horizontal base includes shaft support means standing so as to extend above the staple mount magazine, said operation shaft member is disposed above the staple mount magazine in engagement with the shaft support means, and said operation handle is connected to the operation shaft member in engagement with the shaft support means.

3. A stapler including a horizontal base, an operation handle, a staple striking blade plate, and a staple mount magazine with which is mounted a connected staple assembly cassette having a case body and a connected staple assembly composed of a number of staples disposed in the case body, said horizontal base, said operation handle and said staple mount magazine being coupled by means of pivot shaft member,

wherein said staple striking blade plate has an upper portion connected to the operation handle and is disposed between the operation handle and the horizontal base, the staple striking blade plate being vertically movable in association with an operation of the operation handle, and the staple striking blade plate has a vertical width

such that when the operation handle is pushed down in a direction of the horizontal base, a lower end thereof reaches the horizontal base surface,

said staple mount magazine has a mount case, a feed mechanism and a staple lowering slit, said mount case serving to vertically hold the connected staple assembly of a number of staples each having substantially U-shape having a right angled corner portion, having a structure in which both lower end of the bent staple is directed to the horizontal base, and having one end side and another end side so as to be mounted in a range from a front end to a rear end of the staple,

said one end side is mounted to the rear end side of the connected staple assembly, and said the other end side is mounted to the front end portion of the connected staple assembly and provided with the staple lowering slit as a blade plate passage,

said staple lowering slit is formed with an opening so as to guide, in the lowering direction, the staple which is separated from the front end of the connected staple assembly and lowered in the slit,

said feed mechanism includes a mount sensor, a pusher piece, a pusher piece engaging member, and a pusher piece traction spring, said mount sensor having a structure being displaced and deformed by sensing presence or absence of the connected staple assembly,

said pusher piece engaging member engages the pusher

piece and released the engagement under the condition of the displacement and deformation of the mount sensor,

said pusher traction spring elastically pulls the pusher piece in the other end side in the staple mount magazine, and

said pusher piece moves from the one end side toward the other end side in the staple mount magazine as an advance passage, the pusher piece is subjected to elastic traction force in the other end side direction by the pusher piece traction spring and advances in the advance passage when the engagement is released, and the rear end of the connected staple assembly is formed to be elastically pressed in the other end direction of the mount case.

4. The stapler according to claim 3, wherein said feed mechanism is provided with a rear end sensing sensor sensing passing of the rear end of the connected staple assembly at the rear end of the mount magazine at a time of mounting the staple assembly cassette and being displaced and deformed by sensing the passing, and said pusher piece engaging member is provided with releasing means for releasing the engagement with the pusher piece under the condition of the displacement and deformation of the rear end sensing sensor.

5. The stapler according to claim 4, said rear end sensing sensor commonly serves as the mount sensor.

6. A stapler including a horizontal base, an operation handle, a staple striking blade plate, and a staple mount magazine with which is mounted a connected staple assembly cassette having a case body and a connected staple assembly composed of a number of staples disposed in the case body, said horizontal base, said operation handle and said staple mount magazine being coupled by means of pivot shaft member,

wherein said staple mount magazine is provided with a staple mount case, a staple feed mechanism and a staple lowering slit, said staple mount case has a structure in which the connected staple assembly cassette, in which a number of connected staples each having a U-shape bent in a right angle at a corner portion are accommodated, is mounted, the staples are held in the vertical direction and both lower ends of the staple are directed toward the horizontal base,

said staple feed mechanism has a mechanism successively elastically feeding the staple positioned on the front end side of the connected staple assembly in the connected staple assembly cassette into the staple lowering slit path along which the staple striking blade plate is vertically moved,

said staple lowering slit path is opened to the staple striking blade plate moving path so as to guide downward the staple which is separated and lowered from the front end of the connected staple assembly,

said staple striking blade plate is connected at an upper end thereof to the operation handle to be rotatable and disposed between the operation handle and the horizontal base in a suspended state to be vertically movable in association with the movement of the operation handle, and when the operation handle is depressed toward the horizontal base, the operation handle has a vertical dimension such that when the operation handle is lowered, the lower end thereof reaches the horizontal base surface, the operation handle having large and small thickness portions,

the other surface side of the staple striking blade plate forms a perpendicular plane to the lower end thereof, and one surface side forms an inclination surface inclining at the lower end portion of at least the large thickness portion and contacts the connected staple assembly in the staple lowering slit,

said inclination surface formed on one surface side contacts, in the staple lowering slit, the second staple adjacent to the first staple positioned at the front end of the connected staple assembly in the connected staple assembly cassette to be mounted to the staple mount magazine, the staple after the first one advances or retires in the staple lowering slit with a limit corresponding to the thickness of the plate of the staple striking blade plate,

a staple sensor and an advance movement block mechanism are provided parallelly to the staple lowering

slit, and the staple sensor has a mechanism which is displaced and deformed in accordance with presence or absence of the first staple separated from the front end of the connected staple assembly in the staple lowering slit,

said advance movement block mechanism is provided with a movable member which shields the advance path of the second staple during the presence of the first staple in the staple lowering slit in accordance with the displacement and deformation of the staple sensor, projects between the small thickness portions of the staple striking blade plate, and blocks the advance movement of the connected staple assembly after the second staple.

7. A stapler including a horizontal base, an operation handle, a staple striking blade plate, and a staple mount magazine with which is mounted a connected staple assembly cassette having a case body and a connected staple assembly composed of a number of staples disposed in the case body, said horizontal base, said operation handle and said staple mount magazine being coupled by means of pivot shaft member,

wherein said staple mount magazine is provided with a staple mount case and a staple lowering slit, said staple mount case having a structure in which the connected staple assembly cassette is mounted, and said connected staple assembly is accommodated in the case body of the connected staple assembly cassette,

said connected staple assembly cassette is provided with a structure having feed means for successively elastically feeding the connected staple assembly in the front end direction thereof and successively feeding the staple positioned on the front end side of the connected staple assembly in the connected staple assembly cassette into the staple lowering slit along which the staple striking blade plate is moved,

said staple lowering slit is opened to the lower end of the staple striking blade plate so as to guide downward the staple which is separated and lowered from the front end of the connected staple assembly,

said staple striking blade plate is connected at an upper end thereof to the operation handle to be rotatable and disposed between the operation handle and the horizontal base in a suspended state to be vertically movable in association with the movement of the operation handle, and when the operation handle is depressed toward the horizontal base, the operation handle has a vertical width such that when the operation handle is lowered, the lower end thereof reaches the horizontal base surface, the operation handle having large and small thickness portions,

the other surface side of the staple striking blade plate forms a perpendicular plane to the lower end thereof, and one surface side forms an inclination surface inclining at the lower end portion of at least the large thickness

portion and contacts the connected staple assembly in the staple lowering slit,

said inclination surface formed on one surface side contacts, in the staple lowering slit, the second staple adjacent to the first staple positioned at the front end of the connected staple assembly in the connected staple assembly cassette to be mounted to the staple mount magazine, the staple after the second one advances, stops or retires in the staple lowering slit with a limit corresponding to the thickness of the plate of the staple striking blade plate,

a staple sensor and an advance movement block mechanism are provided parallelly to the staple lowering slit, and the staple sensor has a mechanism which is displaced and deformed in accordance with presence or absence of the first staple separated from the front end of the connected staple assembly in the staple lowering slit,

said advance movement block mechanism is provided with a movable member which shields the advancing path of the second staple during the presence of the first staple in the staple lowering slit in accordance with the displacement and deformation of the staple sensor, projects between the small thickness portions of the staple striking blade plate, and blocks the advance movement of the connected staple assembly after the second staple.

8. The stapler according to claim 6 or 7, wherein said staple lowering slit has an opening surrounded by a perpendicular stationary wall section and a plate spring wall sensor as the staple sensor; said plate spring wall sensor has a lower end elastically contacting a lower portion of the perpendicular stationary wall section; a lower portion of the plate spring wall sensor serves to open the staple lowering slit while describing an arc at a distance corresponding to at least a thickness of the staple; said advance movement blocking mechanism is provided with a vertically movable member which is provided to a back surface of the plate spring wall sensor and follows up rotation of the plate spring wall sensor, has a lower end which is separated from the perpendicular stationary wall section upon the rotation of the plate spring wall sensor, opens the staple lowering slit and rises upward at the rear surface of the plate spring wall sensor in accordance with the opening movement of the staple lowering slit; and said vertically movable member is provided with a movable member as a vertically movable projection which projects at a corner portion at which the inclination surface of the lower end portion of the staple striking blade plate contacts the second staple, and blocks the advance movement of the connected staple assembly after the second staple in the advance passage of the second staple.

9. A connected staple assembly cassette, wherein two horizontal plate wall bodies are vertically provided, each of which has a length longer than a length between a front end of a connected staple assembly formed by connecting a number of staples each having substantially U-shape with an corner portion bent at a right angle and rear end thereof with a width of clamping both leg portions of the staple,

a case body is formed so as to be surrounded in three directions by a both wall sections of the horizontal plate wall bodies and a top plate disposed on upper ends of both the wall sections so as to have a length more than a length between the front end of the connected staple assembly and the rear end thereof,

a number of reverse movement block irregular portion are formed in form of connected beads to a front end of a wall section or top plate to a rear end thereof at an inner periphery of the case body, and the connected staple assembly is mounted to a front end side of the inner periphery of the case body,

a stop edge projecting on the inner periphery side of the case body is provided for at least either one of the wall section or top plate at the front end of the case body,

the staple striking blade plate abutting against at least a first staple of the front end of the connected staple assembly opens an exposed portion without covering

the upper portion of the first staple with the top plate by an amount corresponding to a thickness thereof,

a reverse movement stop feeder for blocking a reverse movement of the connected staple assembly is mounted in the case body at the rear end of the connected staple assembly, and

said reverse movement stop feeder is provided with a pawl projection for stopping the reverse movement, the pawl projection has an elastic portion slidable in the advancing direction and preventing the advancing movement in the reverse direction, the elastic portion is elastically engaged with the reverse movement blocking irregular portion, and the pawl projection advances from the rear end side to the front end side in the base body in accordance with reduction of the staples of the connected staple assembly.

10. The connected staple assembly cassette according to claim 9, wherein said reverse movement stop feeder serves to connect, by an elastic coupling portion, a proceeding piece and a following piece following up the proceeding piece, and said reverse movement blocking pawl projection is provided for the following piece.